Five-Year Review Report

First Five-Year Review Report
for
Mid-America Tanning Superfund Site

Sergeant Bluff, Iowa

Woodbury County, Iowa

July 2003

Prepared by:

U.S. Environmental Protection Agency
Region 7
Kansas City, Kansas

Approved by:

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Superfund Division

7/11/03
Date

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List of Acronyms

AWQC.....	Ambient Water Quality Criteria
ARAR.....	Applicable or Relevant and Appropriate Requirement
CD.....	Consent Decree
CERCLA.....	Comprehensive Environmental Response, Compensation, and Liability Act
CIC.....	Community Involvement Coordinator
EPA.....	United States Environmental Protection Agency
CFR.....	Code of Federal Regulations
CWA.....	Clean Water Act
ESD.....	Explanation of Significant Difference
MCL.....	Maximum Contaminant Level
NCP.....	National Contingency Plan
NPL.....	National Priorities List
O&M.....	Operation and Maintenance
PRP.....	Potentially Responsible Party
RA.....	Remedial Action
RAO.....	Remedial Action Objective
RCRA.....	Resource Conservation and Recovery Act
RD.....	Remedial Design
RI/FS.....	Remedial Investigation/Feasibility Study
ROD.....	Record of Decision
RPM.....	Remedial Project Manager
TBC.....	To Be Considered

EXECUTIVE SUMMARY

The source control remedy for the Mid-America Tanning Superfund Site near Sergeant Bluff, Iowa, included excavation of contaminated soil, sediment and sludge materials and placement of those materials in landfill areas; treatment of free waste waters located in several site impoundments; installation of floating geosynthetic covers on existing site lagoons; decontamination by steam cleaning of selected site facilities; and installation of chain link fencing. Groundwater monitoring showed no contamination of the groundwater. Institutional controls were put in place to protect any future purchasers of the site. The site achieved construction completion with the signing of the Final Close Out Report on September 12, 2000. The trigger for this Five-Year Review was the obligation of money for the start of construction on September 30, 1998.

The assessment of this Five-Year Review found that the source control remedy was constructed in accordance with the requirements of the Record of Decision (ROD) dated September 24, 1991 and the ROD Amendment dated July 29, 1996. A second ROD was issued on August 30, 2000, to clarify that no additional groundwater monitoring or remedy was needed at the site. The source control remedy is currently functioning as designed. The immediate threats have been addressed and the remedy is protective.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: Mid-America Tanning Superfund Site		
EPA ID *(from WasteLAN)*: IAD085824688		
Region: 7	**State:** IA	**City/County:** Sergeant Bluff/Woodbury
SITE STATUS		
NPL status: ☒ Final ☐ Deleted ☐ Other (specify)		
Remediation status (choose all that apply): ☐ Under Construction ☐ Operating ☒ Complete		
Multiple OUs?* ☐ YES ☒ NO	**Construction completion date:** 9 / 12 / 2000	
Has site been put into reuse? ☒ YES ☐ NO		
REVIEW STATUS		
Lead agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency		
Author name: Bob Stewart		
Author title: Remedial Project Manager	**Author affiliation:** U.S. EPA, Region 7	
Review period:** 1 / 28 / 2003 to 8 / 31 / 2003		
Date(s) of site inspection: 4 /29 / 2003		
Type of review: ☒ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion)		
Review number: ☒ 1 (first) ☐ 2 (second) ☐ 3 (third) ☐ Other (specify)		
Triggering action: ☐ Actual RA On-site Construction___ ☐ Construction Completion ☐ Other (specify) ☒ Actual RA Start at OU# NA ☐ Previous Five-Year Review Report		
Triggering action date *(from WasteLAN)*: 9 / 30 / 1998		
Due date *(five years after triggering action date)*: 9 / 30/ 2003		

* ["OU" refers to operable unit.]

** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issues:

Evidence of vehicle tracks in the vegetation of the landfill caps.

Some warning signs north of the covered lagoons had fallen.

Recommendations and Follow-up Actions:

Communication with owner of property should also be undertaken to keep vehicles and stumps off the landfill caps to avoid damage to the caps and to repair and reseed the affected areas.

Warning signs should be established and maintained where they have fallen in the area north of the covered lagoons.

Protectiveness Statement(s):

The remedy at the site, in its present state, is protective of human health and the environment. All threats at the site have been addressed through capping of contaminated soils and wastes on site, construction of floating covers over the lagoons, access controls and institutional controls.

Long-term Protectiveness:

Long-term protectiveness of the remedial action will be verified by continuing inspections and maintenance. Data indicate no impacts to surface water or groundwater from the site. Monitoring indicates that the remedy is functioning as intended.

Other Comments:

None.

MID-AMERICA TANNING SUPERFUND SITE
SERGEANT BLUFF, IOWA
FIRST FIVE-YEAR REVIEW REPORT

I. INTRODUCTION

The purpose of the Five-Year Review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

The Agency is preparing this Five-Year Review report pursuant to CERCLA Section 121 and the National Contingency Plan (NCP). CERCLA Section 121(c) states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section 104 or 106, the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The Agency interpreted this requirement further in the NCP; 40 CFR 300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The United States Environmental Protection Agency (EPA), Region 7, conducted the Five-Year Review of the remedy implemented at the Mid-America Tanning Superfund Site in Sergeant Bluff, Iowa. This review was conducted by the Remedial Project Manager (RPM) for the entire site from January 2003 through June 2003. This report documents the results of the review.

This is the first Five-Year Review for the Mid-America Tanning Site. The triggering action for this statutory review is the obligation of funding of the remedial action on September 30, 1998. The Five-Year Review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

II. SITE CHRONOLOGY

Table 1 - Chronology of Site Events

Event	Date
Tannery operations at the site	1970-1989
Final listing on EPA National Priorities List	3/31/1989
EPA removal action to stabilize site and excavate and stockpile sludge	1990-1991
Remedial Investigation/Feasibility Study made available to public	7/16/1991
Proposed plan identifying EPA's preferred remedy presented to public; start of public comment period	7/16/1991
ROD selecting the source control remedy is signed	9/24/1991
Remedial Design completed	9/1993
Administrative order issued to compel second removal action	8/1994
PRP removal completed	7/1995
ROD Amendment to change remedy design because of hydrogen sulfide concerns in impoundment sludge	7/29/1996
Consent Decree finalizing settlement for responsible party payment for remedy entered by Federal Court	5/10/1998
Second remedial design completed	9/1998
Start of on-site construction (date that triggers Five-Year Review).	9/30/1998
Pre-final inspection of remedial action	12/20/1999
Completion of on-site physical construction	7/2000
Completion of ROD determination on groundwater	8/30/2000
Final Close Out Report signed	9/12/2000
O&M Plan approved; source control remedy operational and functional	9/12/2000

III. BACKGROUND

Physical Characteristics

The Mid-America Tanning site occupies 98.7 acres in Woodbury County, Iowa, located approximately 10 miles south of Sioux City and about 6 miles south of Sergeant Bluff. Sergeant Bluff is a community of approximately 3300 residents. Attachment 1 shows the location of the site. Attachment 2 shows a map of the various components of the site itself.

Land and Resource Use

The site was operated as a leather tannery from 1970 to 1989. The site lies in an industrial park; other current surrounding land use is agricultural. A portion of the site is bordered by Oxbow Lake and lies within the 100-year floodplain. The Missouri River is approximately 1.5 miles to the southwest of the site and receives discharges from Oxbow Lake. It is anticipated that land use in the surrounding area will remain similar to current uses. The site is currently partially fenced and the covered surface impoundments are contained within a fenced area. The groundwater beneath the site is not currently used as a drinking water source, but groundwater is used as a drinking water source near the site.

History of Contamination

In 1973, the plant began using a chrome tanning process. The process wastewater treatment system produced a sludge that was high in chromium and contained other chemicals. On-site surface impoundments were used to store the sludge. Ultimate disposal of the sludge was by burial in onsite trenches and land application to on-site soils. Chromium-containing sediments also accumulated in another on-site surface impoundment, the waste water polishing basin. Occasional system overloads resulted in overflow of chromium wastewater into Oxbow Lake. When the facility ceased operations in 1989, there was an estimated 5,000 gallons of chromium tanning solution on site along with 525 gallons of sulfuric acid used in the tanning process. The site posed a threat to the public health through direct contact and through potential migration of chromium into the surrounding groundwater that is the primary drinking water source for approximately 850 individuals who live in the surrounding 3 mile radius of the site.

Initial Response

The site was proposed to the National Priorities List (NPL) in June 1988 and became final in March 1989 (54 FR 13296). Because of imminent health threats, EPA initiated a removal action in 1990. The EPA removal action was directed toward immediate site stabilization measures and included excavation and stockpiling of contaminated sludge from the on-site burial trench, containment and treatment of chromium tanning solutions, containment and neutralization of sulfuric acids, and cursory decontamination of the buildings. In conjunction with the removal activities, EPA conducted an investigation into the nature and extent of the contamination at the

activities, EPA conducted an investigation into the nature and extent of the contamination at the site and, in September 1991, decided on a cleanup plan which was explained in a "record of decision" (ROD). The cleanup plan included on-site stabilization of contaminated wastes followed by installation of a soil cap and continued monitoring of the groundwater. Subsequently, EPA determined that the sludge in the surface impoundment was emitting hydrogen sulfide gas and that the implementation of the stabilization component of the cleanup plan would likely result in the release of this gas at concentrations which would pose a threat to public health and the environment. In response to the new data regarding the hydrogen sulfide emissions, the EPA modified the cleanup plan for the site. The modified plan included dewatering the impoundment areas; treating and discharging the impoundment waters; excavating contaminated soils and combining them with the contaminated impoundment sludge; capping the impoundment soil/sludge; and decontaminating various cement structures and a portion of one building. The EPA detailed the changes in the cleanup plan for the site in an amended source control ROD issued in July 1996. Based on previous investigations at the site and EPA experience at similar "green tanning" sites, the source control ROD established an action level of 2,000 mg/kg of total chromium in surface soils. In May 1996, the proposed plan identifying the preferred source control remedy was presented to the public for their review and comment, along with the Remediation Investigation/Feasibility Study (RI/FS) reports.

Following the initial removal action performed by EPA in 1990, site conditions deteriorated due to vandalism and areas of the site were re-contaminated. In 1994, EPA issued an Administrative Order to Foxley Cattle Company, a Potentially Responsible Party (PRP), to perform a second removal action to address re-contamination concerns. The removal action performed by Foxley was completed in 1995 and consisted of decontaminating buildings, removal and disposal of drummed wastes, and securing the site buildings and man-holes.

Basis for Taking Action: Contaminants

The main contaminant of concern at the site is chromium, which is of concern primarily in the surface soils and exposed wastes. Exposures to soil and exposed wastes are associated with significant human health risks, due to exceedance of EPA's risk management criteria for either the average or the reasonable maximum exposure scenarios. Potential carcinogenic risks were highest for exposure to soils and waste potentially containing hexavalent chromium. Non-carcinogenic hazards were highest for exposure to sediments and sludges containing trivalent chromium.

IV. REMEDIAL ACTIONS

Remedy Selection

The amended ROD for the site source control remedy was signed on July 29, 1996. Remedial Action Objectives (RAOs) were developed as a result of data collected during the Remedial

Investigation to aid in the development and screening of remedial alternatives to be considered for the ROD. The RAOs for the site were:

1. Prevent site workers from inhaling contaminated soil and remove contaminant sources to prevent future groundwater contamination;

2. Prevent site workers from dermal contact with sediments and remove contaminant sources to prevent future groundwater contamination.

The major components of the source control remedy selected in the amended ROD include:

- excavation and relocation of on-site contaminated soil, sediment and sludge materials;
- coverage of those materials with multi-media landfill cap structures;
- treatment of free wastewaters located in several site impoundments;
- installation of floating geosynthetic covers on existing site lagoons;
- decontamination by steam cleaning of selected site facilities; and
- decontamination of selected buildings;
- transfer of wastewaters from and to selected surface impoundments;
- installation of chain link fencing; and
- institutional controls, including a deed notice and state registry restrictions, to control future land use at the site.

Institutional controls were required for the site. These controls were sought in two ways. First, before remediation, the state had already placed the site on Iowa's Registry of Hazardous Waste or Hazardous Substance Disposal Sites, which prevents changes in land ownership or use without state approval. A registry notice was put in place by the state. Second, a deed notice was placed on the site property to warn potential purchasers of the presence of hazardous waste remaining on site.

A second ROD was issued on August 30, 2000, to clarify that no additional groundwater monitoring or remedy was needed at the site. A further assessment of the groundwater at the site was completed in December 1997 in accordance with the sampling plan approved by EPA. Twenty-one monitoring wells were sampled, obtaining water from both shallow and deep water-bearing zones at the site. These samples were analyzed for 19 analytes. The assessment showed that groundwater flow direction was consistent with that previously determined and also found that upward hydraulic gradients were present. These upward gradients are important because they prevent downward contaminant migration and help limit migration at the site. Metals detected in groundwater samples, including arsenic, barium and chromium, were well below Maximum Contaminant Levels (MCL); the highest chromium levels were less than 10% of the MCL. Lead, aluminum and arsenic were below Iowa Aquatic Standards as well. ROD issuance followed a public notice period and public meeting, which determined that no further action was necessary for the groundwater at the site.

Remedy Implementation

In a Consent Decree (CD) effective on May 10, 1998, two responsible parties agreed to pay certain past and future costs for cleaning up the site. The remedial design (RD) was conducted in conformance with the amended source control ROD. The RD was approved by EPA on September 25, 1998.

The remedial action (RA) was initiated on September 30, 1998, and the physical construction activities were completed on July 27, 2000. The EPA conducted a pre-final inspection on December 20, 1999. At this time, all the major remedial action work elements had been substantially completed and the subcontractor was ready to demobilize from the site. A short list of uncompleted items was prepared and distributed to all the contractual parties. A final inspection was conducted on May 19, 2000, and a revised punch list was prepared based on the observations made during the site visit. All items on the final punch list had been corrected by July 27, 2000.

The construction completion designation was achieved when the Final Close Out Report was signed on September 12, 2000.

System Operation, Operation and Maintenance

The state of Iowa is conducting operation and maintenance activities pursuant to the Surveillance and Maintenance Plan that was approved by EPA on September 12, 2000. Operation and maintenance of the landfill caps, floating covers, and fences is required, since waste was left in place as part of the final source control remedy. The Plan, dated September 1998 and revised by technical memorandum of June 19, 2000, lists the activities to be performed, including inspections every six months to ensure erosion control, floating cover maintenance, mowing, and fence maintenance. Institutional controls are in place to prohibit land use changes and review and approve changes in ownership, through the Iowa State Registry of Hazardous Waste or Hazardous Substance Disposal Sites program, and through a notice on the deed. The site was sold for back taxes by the county, with state and EPA approval, and is now owned by a landscaping business, thereby returning the site to productive use and the property to the tax rolls.

The amended source control ROD estimated that annual Operation & Maintenance (O&M) costs would be about $25,000 per year. Based on cost estimates received from the state, the ROD estimate appears to be high; about $7,000 was spent on maintenance and monitoring last year.

V. PROGRESS SINCE THE LAST Five-Year Review

This was the first Five-Year Review for the site.

VI. FIVE-YEAR REVIEW PROCESS

Administrative Components

The state of Iowa was notified of the initiation of the Five-Year Review. The Five-Year Review team was led by Bob Stewart, Remedial Project Manager (RPM) for the site, and included Bob Drustrup, Iowa Dept of Natural Resources (IDNR). The review was conducted between January 28, 2003 and June 30, 2003. It included community involvement, document review, site inspection, and report development and review.

Community Involvement

Activities to involve the community in the Five-Year Review were initiated in May 2003 by the RPM and the Community Involvement Coordinator (CIC) for the site. A notice was published in the Sergeant Bluff Advocate on June 5, 2003, and a fact sheet sent to parties on the EPA mailing list, explaining the initiation of the Five-Year Review. The notice and fact sheet invited the public to submit any comments to EPA. *No comments were received.*

Soon after approval of this report, a notice will be placed in the same local newspaper announcing that the Five-Year Review is complete, and that the results of the review and the report is available to the public at the Sergeant Bluff City Hall and the EPA Region 7 library.

Document Review

This Five-Year Review included a review of relevant documents including O&M records and inspection reports.

Site Inspection

An inspection was conducted at the site on April 29, 2003, by the RPM and Bob Drustrup, IDNR. The purpose of the inspection was to assess the protectiveness of the source control remedy, including the presence of fencing to restrict access and the integrity of the landfill caps and the surface impoundment covers. Institutional controls were evaluated by visiting the County Recorder of Deeds to review the notice on the deed. The deed record contained the restrictions called for and did also mention the state registry.

Examination of the site revealed no major problems. Fencing was in place, and no evidence of damage was noted. The necessary O&M documents were available with the state officials. The access controls and institutional controls have been effective in preventing the use or disturbance of the landfill caps and floating covers in any way that might interfere with the source control remedy. No activities were observed that violated the institutional controls. The landfill caps and floating covers were undisturbed except for some minor vehicle tracking problems on the landfill caps.

The landfill surfaces were in excellent condition. No settlement, cracking, erosion, or holes were noted. The vegetative cover was well established, and no problems were evident.

VII. TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, Applicable or Relevant and Appropriate Requirements (ARAR), risk assumptions, and the results of the site inspection indicates that the source control remedy is functioning as intended by the amended ROD. The capping of the landfill areas and the impoundment cover have achieved the remedial objectives of preventing site workers from inhaling contaminated soil and dermal contact with sediments, and of controlling contaminant sources to prevent future groundwater contamination. The effective implementation of access and institutional controls has prevented exposure as well.

Operation and maintenance of the landfill caps and floating cover has been effective. There are no indications of any difficulties with the landfill caps and floating cover.

There were no opportunities for system optimization observed during this review. Maintenance of the landfill caps, fence and floating cover is sufficient to maintain their integrity. No activities were observed that have violated the institutional controls. The landfill caps and floating cover were undisturbed and the fence around the impoundments is intact and in good repair.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the source control remedy.

1. Changes in Standards and To Be Considereds (TBCs)

The remedial construction work at the site has been completed, and all ARARs cited in the source control ROD have been met. A list of ARARs is included in Attachment 3. There have been no changes in these ARARs, and no new standards or TBCs are needed to assure protectiveness of the source control remedy.

2. Changes in Exposure Pathways, Toxicity, and other Contaminant Characteristics

The exposure assumptions used to develop the Human Health Risk Assessment included both current exposures (adult hunter/trespasser scenario) and potential future exposures (future child resident, future adult resident and future adult construction and industrial worker). There have been no changes in the toxicity factors for the contaminants of concern that were used in the

resident, future adult resident and future adult construction and industrial worker). There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment. These assumptions are considered to be conservative and reasonable in evaluating risk and developing risk-based cleanup levels. No change to these assumptions, or the cleanups levels developed from them, is warranted. There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the source control remedy.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

In the RODs, the ecological risks at the site were judged to be minimal. Additional groundwater sampling during remedial action has shown no discernible impact to the groundwater from the site, and hence no impact to the oxbow lake or river. No additional risks to the environment have been identified in the Five-Year Review. We believe that the current land use of the site will not change. There is no other information that calls into question the protectiveness of the source control remedy.

Technical Assessment Summary

According to the documents reviewed and the site inspection, the source control remedy is functioning as intended by the amended ROD. There have been no changes in the physical conditions at the site that would affect the protectiveness of the source control remedy. The ARARs cited in the ROD have been met. There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment, and there have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the source control remedy. There is no other information that calls into question the protectiveness of the source control remedy.

VIII. ISSUES

Table 2 - Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Evidence of vehicle tracks in the vegetation of the landfill caps	N	N
Some warning signs north of the covered lagoons had fallen	N	N

IX. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Table 3 - Recommendations and Follow-Up Actions

Issue	Recommendations /Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Vehicle tracks on landfill caps	Communication with site owner should be undertaken to keep vehicles off the landfill caps and to repair/reseed affected areas.	State	EPA	8/30/2003	N	N
Fallen warning signs	Warning signs should be established and maintained where they have fallen in the area north of the covered lagoons.	State	EPA	9/30/2003	N	N

X. PROTECTIVENESS STATEMENT

The source control remedy at the site is protective of human health and the environment. All threats at the site have been addressed through capping of contaminated soils and wastes on site, construction of covers on the surface impoundments, and access and institutional controls.

Long-term protectiveness of the remedial action will be verified by continuing inspections and maintenance, as specified in the Surveillance and Monitoring Plan.

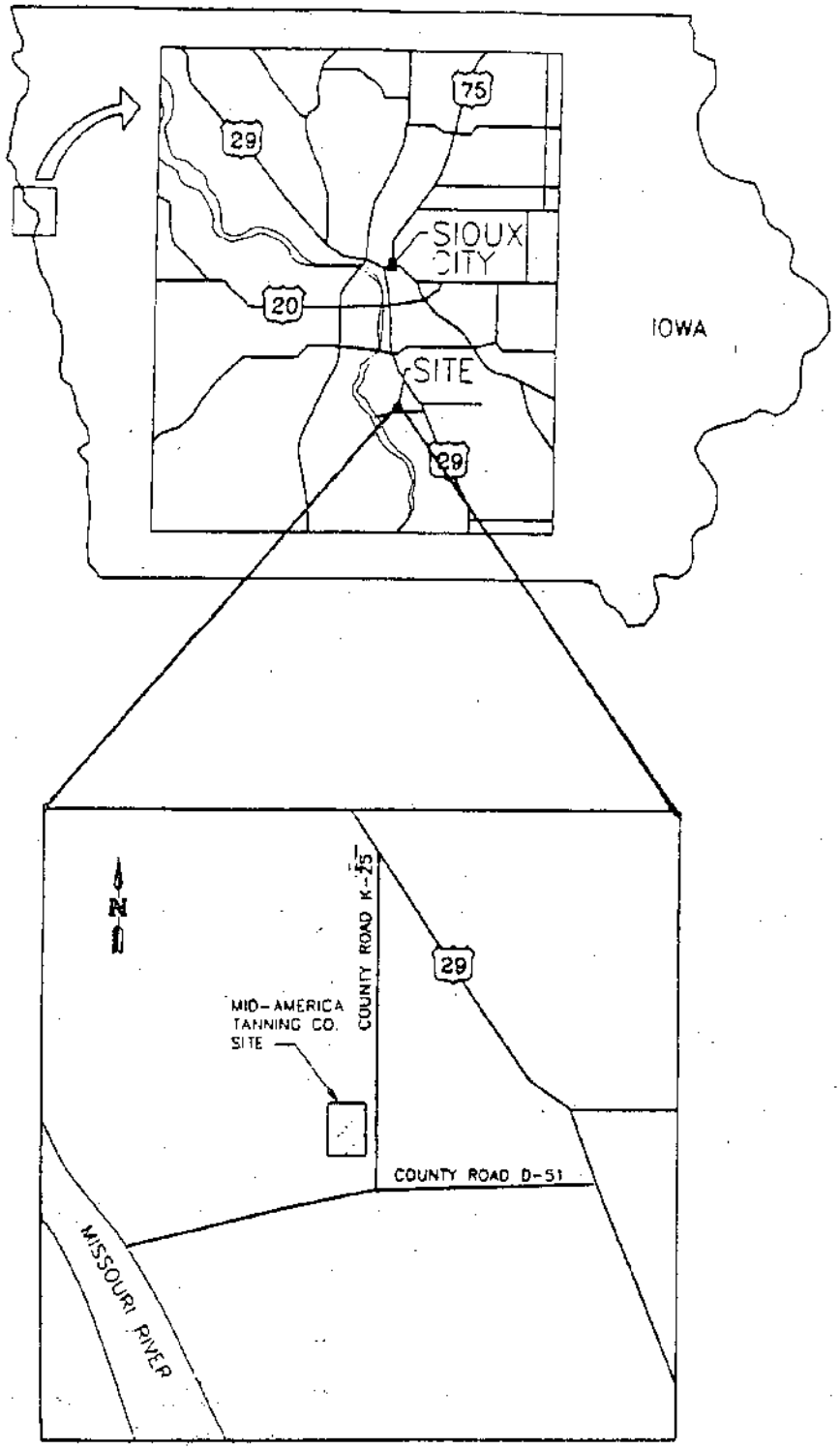
XI. NEXT REVIEW

The next Five-Year Review for the Mid-America Tanning Superfund Site is required by September 2008, five years from the date of this review.

ATTACHMENTS

ATTACHMENT 1

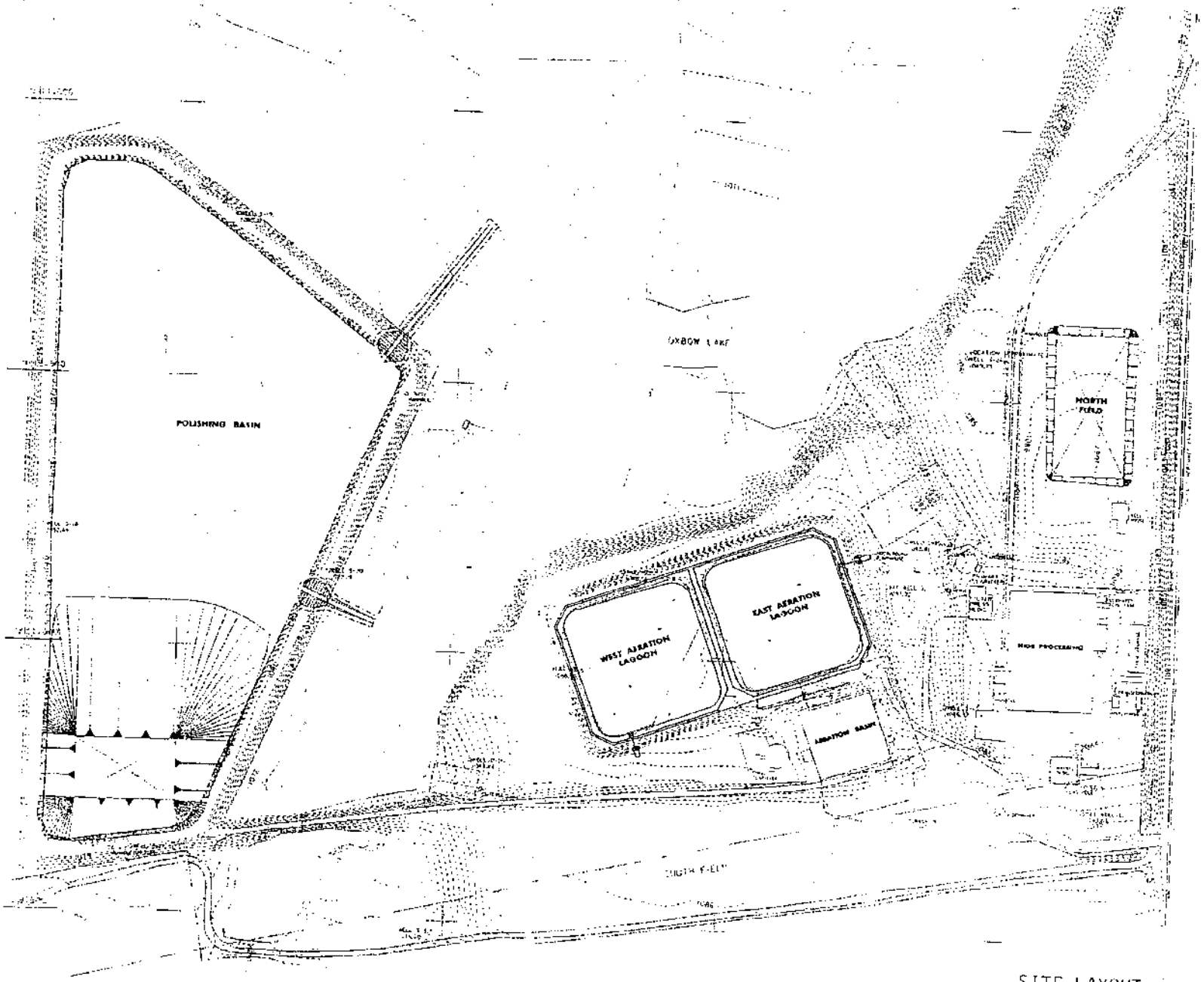
Site Location Map



VICINITY MAP
FIGURE 1-1

ATTACHMENT 2

Site Plan



SITE LAYOUT
FIGURE 1-2

ATTACHMENT 3

List of Documents Reviewed

List of Documents Reviewed

Consent Decree, United States v. Foxley Cattle Co & Andrew M. Hain, May 10, 1998

Amendment to Record of Decision, Mid-America Tanning Site, July 29, 1996

Surveillance and Maintenance Plan, Mid-America Tanning Site, September 1998

Memorandum of Revision to Surveillance and Maintenance Plan, June 19, 2000

Groundwater Sampling Report, Mid-America Tanning Site, January 28, 1998

Final Close Out Report, Mid-America Tanning Site, September 12, 2000

Record of Decision, Mid-America Tanning Site, September 24, 1991

Record of Decision-Groundwater, Mid-America Tanning Site, August 30, 2000

Remedial Design, Mid-America Tanning Site, January 15, 1999

Final Remedial Action Report, Mid-America Tanning Site, September 2000

ATTACHMENT 4

Applicable or Relevant and Appropriate Requirements (ARARs)

Medium/ Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR
Surface Water/Clean Water Act (CWA)	Federal - CWA - Ambient Water Quality Criteria (AWQC)- Protection of Freshwater Aquatic Life, Human Health, Fish Consumption State - Chapter 61, Iowa Water Quality Standards, and Chapter 62, Iowa Effluent and Pretreatment Standards.	Relevant & Appropriate	AWQC are developed under the Clean Water Act (CWA) as guidelines from which states develop water quality standards. CERCLA §121(d)(2) requires compliance with such guidelines when they are relevant and appropriate. A more stringent AWQC for aquatic life may be found relevant and appropriate rather than an MCL, when protection of aquatic organisms is being considered at a site. Federal AWQC are health-based criteria which have been developed for 95 carcinogenic compounds; these criteria consider exposure to chemicals from drinking water and/or fish from drinking water and/or fish consumption. National Pollutant Discharge Elimination System (NPDES) limits are established in association with AWQC.	The selected source control remedy included treatment and discharge of contaminated surface waters at the site. This action has attained NPDES limits and AWQC in the treated water.

Medium/ Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR
Solid Waste Disposal Act/RCRA	Federal 40 CFR Part 261, 257 State -Chapter 131, Hazardous Substances and Waste	Relevant & Appropriate	These regulations require the determination of waste as hazardous or non-hazardous, and the handling of such waste in a safe manner. EPA regulations addressing the Occupational Safety and Health Act (OSHA) and waste transportation requirements are also relevant and appropriate.	Waste residuals created during the site cleanup were handled pursuant to these regulations.
Solid Waste	State Solid Waste 567 IAC 110	Relevant & Appropriate	Sanitary landfill monitoring, closure, and post-closure regulations were considered relevant and appropriate.	These requirements were met in the design of the landfill caps.
Cleanup actions to protect groundwater	Federal - Safe Drinking Water Act State - Public Quality Standards (Chapter 41), Cleanup Actions (Chapter 133)	Relevant & Appropriate	These standards were considered to apply to the cleanup of the waste and contaminated soils at the site, and their collection in designed landfills with caps.	The source control remedy was carried out to isolate the contaminants remaining at the site in three protected areas by designed landfill cap and floating cover systems.